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ABSTRACT

This report describes an experimental program developed by the RAND Corporation to prevent or reduce the use of alcohol, cigarettes and marijuana by adolescents. Section 1 introduces Project ALERT and presents major findings and conclusions from a study which assessed the program's effects at several points over a period of 15 months in 30 California and Oregon schools. Section 2 discusses issues in preventing adolescent drug use. Rationale is presented for the focus on alcohol, cigarettes and marijuana. Prevention is discussed as a strategy for combatting adolescent use of drugs with guidelines for developing and introducing programs. The social influence model is introduced, discussed, and compared with both the information and affective models of prevention. Section 3 describes the curriculum, experimental design and evaluation of Project ALERT. Information about obtaining accurate reports of substance use, and how the program works for different risk groups is included. Section 4 describes the levels of drug use in the sample and presents the results of the study. This section specifically looks at where Project ALERT was effective and where it was less effective. Section 5 presents conclusions and their implications for future drug prevention programs. Appendices provide detailed descriptions of Project ALERT sessions, baseline survey items and detailed program results by substance. (98 references) (LLL)

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Prospects for Preventing Drug Use Among Young Adolescents

Phyllis L. Ellickson, Robert M. Bell

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Phyllis L. Ellickson, Robert M. Bell

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PREFACE

In 1983, the Conrad N. Hilton Foundation asked The RAND Corporation to undertake an investigation of possible strategies for dealing with the serious national problem of adolescent drug use. The study concluded that prevention was likely to be far more effective than law enforcement or treatment, and it identified a prevention approach that had shown promise in curbing adolescent smoking. This approach is based on the social influence model, and it appears to have promise for curbing adolescent use of other drugs as well.

To explore this possibility, the Hilton Foundation asked RAND to design, field, and evaluate a field experiment. The experimental program, called Project ALERT, was aimed at preventing or reducing young adolescents' use of alcohol, cigarettes, and marijuana.

Project ALERT was tested on seventh and eighth graders at 30 schools in California and Oregon between 1984 and 1986. Its effects were assessed at several points between the baseline and 15 months. This report describes the program and its effects and discusses its policy implications.

The study and its results should be of interest to policymakers, school officials, teachers, and others concerned with reducing adolescent drug use.

Other aspects of the study have been discussed in several earlier publications, including the following:

Phyllis L. Ellickson and Robert M. Bell, "Drug Prevention in Junior High: A Multi-Site Longitudinal Test," *Science*, 247:1299–1305, 1990.

Phyllis L. Ellickson, Robert M. Bell, Margaret A. Thomas, Abby E. Robyn, and Gail L. Zellman, *Designing and Implementing Project ALERT: A Smoking and Drug Prevention Experiment*, The RAND Corporation, R-3754-CHF, December 1988.

Robert M. Bell, Cyndie Gareleck, and Phyllis L. Ellickson, *Baseline Nonresponse in Project ALERT: Does it Matter?* The RAND Corporation, N-2933-CHF, March 1990.

Phyllis L. Ellickson and Jennifer A. Hawes, "An Assessment of Active Versus Passive Methods for Obtaining Parental Consent," *Evaluation Review,* 13(1):45–55, 1989.

Robert M. Bell and Phyllis L. Ellickson, "Does Pooling Saliva for Cotinine Testing Save Money Without Losing Information?" *Journal of Behavioral Medicine,* 12(5):503–507, 1989.

Phyllis L. Ellickson, Domenica Bianca, and Diane C. Schoeff, "Containing Attrition in School-Based Research: An Innovative Approach," *Evaluation Review,* 12(4):331–350, 1988.

Phyllis L. Ellickson and Abby E. Robyn, *Toward More Effective Drug Prevention Programs,* The RAND Corporation, N-2666-CHF, October 1987.

Phyllis L. Ellickson, *Project ALERT: A Smoking and Drug Prevention Experiment, First Year Progress Report,* The RAND Corporation, N-2184-CHF, 1984.

SUMMARY

Prevention programs can play a key role in the nation's anti-drug campaign. That is the major conclusion of Project ALERT (Adolescent Learning Experiences in Resistance Training), a program developed at RAND to prevent or reduce the use of alcohol, cigarettes, and marijuana by adolescents. Project ALERT was tested in 30 schools in California and Oregon between 1984 and 1986. In addition to providing very encouraging findings about the potential effectiveness of drug prevention programs, it also demonstrated what such programs can and cannot be expected to accomplish and dispelled some common misconceptions about them.

Designed for seventh and eighth graders, Project ALERT specifically targets alcohol, cigarettes, and marijuana because these are the drugs that are used first and most widely by young people. Curbing the use of these so-called "gateway" drugs is critically important not only because of the threat they pose to the health, development, and safety of the nation's adolescents, but also because prior use of these drugs, particularly marijuana, is virtually a precondition to using cocaine, crack, and other hard drugs. Moreover, the earlier young people start using, the longer they risk these adverse effects. Thus, any delay or reduction in the use of the gateway drugs is an important gain.

THE SOCIAL INFLUENCE MODEL

The Project ALERT curriculum is based on the social influence model of prevention. This model was chosen because (1) early prevention programs based on other approaches have had little success, (2) the social influence model addresses peer influences, which are an extremely powerful factor in adolescent behavior, and (3) programs based on this model have shown promise in curbing adolescent smoking.

Adolescents typically start using drugs because of perceived pressure from peers, the media, and adults who use or approve of using drugs. The social influence model addresses these pressures; programs based on it attempt to help young people understand how smoking will affect them personally and provide guidance on ways to resist offers of drugs and to counter pro-drug arguments. Evaluations

indicate that such programs have been moderately to very effective in reducing adolescent smoking.

This record makes the social influence model look promising for more general drug prevention efforts. However, the anti-smoking programs were tested in circumstances that raise questions about the model's broader potential. All of those programs were tried at a time when society's attitudes toward smoking had become progressively more negative. Consequently, an underlying climate of societal disapproval could be essential for success of social influence programs with cigarettes and other drugs. In addition, the anti-smoking programs were typically implemented in white, middle-class communities, and it was not known whether this approach would be effective in mixed communities with substantial minority populations. These were the major issues that Project ALERT was designed to address.

PURPOSE OF THE EXPERIMENT

The Project ALERT curriculum was tested in a rigorous field experiment to provide answers to the following questions:

1. Would a prevention program based on the social influence model curb the use of alcohol and marijuana as effectively as it curbed smoking?
2. Would it be equally effective in diverse school environments?
3. Would it be effective for both nonusers and adolescents who were experimenters before participating in the program?
4. Would the program be more effective if teen leaders assisted teachers in program sessions?
5. Would booster sessions reinforce program effects and limit their erosion?

The curriculum consists of eight weekly lessons for seventh graders and three booster sessions presented during eighth grade. It seeks to develop students' motivation and skills to resist pro-drug pressures. The sessions are designed to help students identify these pressures (internal as well as external), to give them counters to pro-drug arguments, and to equip them with a repertoire of resistance strategies. The lessons focus on how drugs affect the students now, personally and socially. Project ALERT sessions are designed to help students connect what they learn to their daily lives: They involve students actively, demonstrate how to use new skills, and provide plenty of practice.

To test the curriculum in a wide range of socioeconomic and ethnic environments, we implemented the experiment at 30 California and Oregon schools in urban, suburban, and rural communities. Nine of the schools had minority populations of 50 percent or more. Each school was randomly assigned to one of three experimental conditions:

1. Students at 10 schools received Project ALERT sessions conducted by teachers only.
2. Students at 10 schools received Project ALERT sessions conducted by teachers assisted by older teen leaders.
3. Students at the remaining 10 schools did not receive the Project ALERT curriculum and served as the control group, i.e., as the basis for comparison.

In analyzing the program's effects, we used advanced statistical techniques that controlled for pre-existing differences among individuals and schools. That and random assignment permitted us to isolate the program's effects and eliminate other factors that might explain differences in drug use among the experimental groups. Program results were assessed at periodic intervals from baseline to 15 months.

FINDINGS

Project ALERT effectively prevented or reduced cigarette and marijuana use among the young adolescents in our sample. The rate of marijuana initiation in the Project ALERT schools was one-third lower than that in the control schools. Regular and daily smoking by students who had experimented with cigarettes before being exposed to the program were reduced by as much as 50 to 60 percent. These effects were reinforced or enhanced by the booster sessions offered in the eighth grade. The program was equally effective in schools with substantial minority populations and in predominantly white schools.

These and other findings undercut three common criticisms of prevention programs, namely, that (1) they work only for children who do not really need them, (2) they are effective only in certain environments, and (3) they prevent only trivial levels of use. In fact, Project ALERT was especially effective in curbing smoking among high-risk students—those who had experimented with cigarettes before being exposed to the program. It worked equally well in schools with different proportions of minority students, and in some

cases was even more effective in high-minority schools. Finally, it reduced high levels of use considerably.

However, Project ALERT is by no means a panacea that would eliminate adolescent drug use. While it was initially successful against alcohol, the early gains in alcohol prevention had eroded by the time the students reached eighth grade. Also, it was not effective with previously confirmed cigarette smokers, who actually smoked more after being involved in the program. This boomerang effect, however, was limited strictly to cigarette smoking.

CONCLUSIONS

Our major conclusion is that school programs based on the social influence model can be highly effective in decreasing substance use among young adolescents. Moreover, such programs can be used across a variety of demographic and socioeconomic groups. By curbing the use of gateway drugs, they also offer the prospect of deflecting progression to hard drugs. We therefore believe that programs based on the social influence model should be implemented in the nation's middle and junior high schools.

Social influence programs are most effective when the prevailing social context reinforces their messages. For example, there is far greater societal disapproval of cigarette and marijuana use than of social drinking, which is widely accepted and practiced. Project ALERT's effects reflect those differences. The program was most successful against the socially disapproved substances; it was less effective in counteracting the forces that promote alcohol use. As long as the media and most adults directly contradict the message, social influence programs are not likely to realize their potential against alcohol.

The importance of prevailing social norms for successful prevention implies that legalizing marijuana and other illicit drugs could undermine prevention efforts. Changing the legal classification of presently illegal substances could convey the message that those substances are acceptable and thus alter the social climate that currently restricts their use. If legalization of drugs also increased adult use, the corresponding message to adolescents would be even more damaging.

Adolescents who are confirmed smokers need a more aggressive program than one based solely on the social influence model. They have already developed pro-smoking attitudes and a network of friends who smoke, drink, and/or use marijuana. Most of them also

have a record of problem behaviors, such as stealing and truancy; they tend to receive poor grades; and many come from disrupted or impaired family environments. If the program promoted associations with nonusing peers and showed confirmed users how to quit, it might make more headway with the early smokers, but it would not address their deeper problems, of which smoking is only one symptom.

Booster programs are critical for maintaining the effects of drug prevention programs. Eighth-grade booster sessions helped prevent the erosion of the program's effects for marijuana, and they significantly increased smoking reductions. These results imply that prevention programs cannot be expected to function as one-shot "inoculations" that guarantee long-term immunity. Further, as an adolescent's peer networks become more diverse, he or she is increasingly exposed to drug use among friends and acquaintances. Extending program effects beyond junior high school may thus require additional booster sessions.

ACKNOWLEDGMENTS

We are very grateful to the Conrad N. Hilton Foundation and its president, Donald H. Hubbs, for their commitment to fighting drug use and their support of research on how to do so more effectively.

Implementing the curriculum and the experimental procedures of Project ALERT required the hard work of many people. Although we cannot acknowledge each of them separately, we do want to thank Peggie Thomas and Jennifer Hawes-Dawson, who directed the field implementation and data collection, respectively. We also appreciate the cooperation of school and district personnel in each of the project sites and the many students who filled out surveys used in our analysis.

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CONTENTS

PREFACE iii

SUMMARY v

ACKNOWLEDGMENTS xi

Section

I. INTRODUCTION 1
- Project ALERT 2
- Major Findings and Conclusions 3
- Organization of the Report 4

II. ISSUES IN PREVENTING ADOLESCENT DRUG USE 5
- Why Focus on Alcohol, Cigarettes, and Marijuana? 5
- What Is the Strategy of Choice to Curb Adolescent Drug Use? 6
- Developing Prevention Programs for Adolescents 7

III. PROJECT ALERT: CURRICULUM, EXPERIMENTAL DESIGN, AND EVALUATION 13
- Overview of the Curriculum 13
- Developing the Project ALERT Curriculum 14
- Experimental Design 18
- Evaluating Program Effects 19

IV. HOW EFFECTIVE WAS PROJECT ALERT? 25
- Drug Behavior and the Program's Potential 25
- Results 26

V. CONCLUSIONS AND IMPLICATIONS FOR FUTURE PREVENTION EFFORTS 36
- Conclusions 36
- Potential Benefits of Social Influence Programs 40

13

Appendix
A. DETAILED DESCRIPTION OF PROJECT ALERT SESSIONS 43
B. BASELINE SURVEY ITEMS OTHER THAN PERSONAL SUBSTANCE USE 51
C. DETAILED PROGRAM RESULTS BY SUBSTANCE 52

REFERENCES 55

I. INTRODUCTION

Drug use among teenagers is a cause of major national concern. It not only threatens the health, safety, and development of the nation's young people, it also jeopardizes their future functioning as adults. The business of adolescence is development, that is, acquiring the coping skills that are critical for becoming healthy, productive adults. The changes that adolescents go through—cognitive, emotional, social, and physical—are an integral part of the process. However, drug use can push this process off track, interfering with motivation and ability to learn, to finish school, to hold a job, or eventually to maintain a stable marriage.[1] Moreover, the earlier young people start using drugs, the longer the period during which they are at risk of damage and the more likely that use will become abuse.[2]

The drugs of choice among adolescents are alcohol, cigarettes, and marijuana. Called the gateway drugs, they—not cocaine, crack, or other hard drugs—are the substances teenagers use first and most often. Although the hard drugs get more attention from legislators and the media, gateway drugs pose substantial risks for adolescents, especially because their use is so widespread and frequently predicts progression to hard drugs.[3]

All of the gateway drugs can trigger serious health, safety, or developmental problems. Because nicotine is so addictive, early smoking is likely to become an entrenched habit, with major health consequences in later life.[4] Alcohol has obvious health risks, and recent research indicates that marijuana can cause developmental and reproductive problems.[5] The use of alcohol and marijuana also makes teenagers vulnerable to accidents and injury. Thus, efforts to control adolescent use of these substances should be given high priority in programs aimed at reducing the nation's drug problems.

Most people would agree that prevention is preferable to treatment or law enforcement for curbing drug use among young people. What is less clear, however, is how prevention can be achieved. Early drug prevention programs had little success. Although several programs

[1]Kandel et al., 1986; Newcomb and Bentler, 1988.
[2]Robins and Przybeck, 1985.
[3]Kandel and Faust, 1975; Yamaguchi and Kandel, 1984.
[4]U.S. Surgeon General, 1988a.
[5]Newcomb and Bentler, 1988; Zuckerman et al., 1989; Institute of Medicine, 1982.

increased young people's knowledge about drugs, and some reduced pro-drug beliefs, disappointingly few had any significant effect on use.[6]

PROJECT ALERT

In 1984, The RAND Corporation undertook a project to develop and test a school-based program for preventing or curbing the use of alcohol, cigarettes, and marijuana among seventh and eighth grade students. The program was based on the social influence model, which had shown promise in efforts to curb adolescent smoking. This model views the initiation of smoking as primarily a response to pressures from the environment—from the media, from peers who smoke, and from adults who smoke or approve of smoking. Programs based on this model have been shown to be moderately successful in reducing adolescent smoking in general—and in some cases, they have been very successful.[7]

In view of that success, we hypothesized that a curriculum based on the anti-smoking model might be effective against other substances as well, since the same influences that prompt young people to start smoking also lead them to try other drugs. We did note, however, that the anti-smoking programs were tested during a period when society's attitude shifted from tolerance to disapproval of smoking. That climate of societal disapproval may have been critical to their success.

This possibility presented a particular challenge, because drinking is widely accepted in American society, and prevention of alcohol use was one of our goals. In addition, most of the anti-smoking programs had been tested in middle-class, suburban schools with very few minority students. We needed to determine whether the social influence approach would be equally effective in more diverse settings.

The experiment and its curriculum were called Project ALERT (Adolescent Learning Experiences in Resistance Training). We drew upon existing theoretical constructs to adapt the model and curriculum to substances other than cigarettes. The experiment was designed to answer five key questions:

[6]Ellickson and Robyn, 1987; Goodstadt, 1986; Moskowitz, 1989.
[7]Cleary et al., 1988; Flay, 1985.

1. Would a prevention program based on the social influence model curb the use of alcohol and marijuana as effectively as it curbed smoking?
2. Would it be equally effective in diverse school environments?
3. Would it be effective for both nonusers and adolescents who were experimenters before participating in the program?
4. Would the program be more effective if teen leaders assisted teachers in program sessions?
5. Would booster sessions reinforce program effects and limit their erosion?

The study was conducted between 1984 and 1986 in 30 California and Oregon schools with students from diverse socioeconomic and demographic backgrounds. The curriculum was delivered in eight weekly lessons during seventh grade, and three booster lessons were presented when the students were in eighth grade.

MAJOR FINDINGS AND CONCLUSIONS

We assessed the program's effects at several points over a period of 15 months. Our major conclusion is that *prevention programs can play an important role in reducing adolescent drug use.*

Project ALERT was very effective in preventing and curbing use of marijuana among both high- and low-risk students. It also curbed use of cigarettes, especially regular and daily use among students who had previously experimented with smoking. The program was less successful in curbing alcohol use, suggesting that the social influence model is more likely to be effective against substances that are disapproved by society. Project ALERT was also not effective for students who were confirmed smokers when the program began. In fact, their use increased. This boomerang effect may reflect a rebellious response by these early smokers, who had already developed strong pro-smoking attitudes and a network of friends who use drugs.

The results also indicate that booster lessons are essential for limiting erosion and strengthening program effects. The eighth grade booster helped maintain earlier gains for marijuana and provided the reinforcement needed for the emergence of significant reductions in smoking. Finally, the program was as effective in schools with a high proportion of minority students as it was in schools with mostly white, middle-class students.

ORGANIZATION OF THE REPORT

Section II of this report discusses issues in preventing adolescent drug use. Section III describes the curriculum, experimental design, and evaluation of Project ALERT. Section IV describes the levels of drug use in the sample at baseline and presents the results of the study. Section V presents our conclusions and their implications for future drug prevention programs.

II. ISSUES IN PREVENTING ADOLESCENT DRUG USE

WHY FOCUS ON ALCOHOL, CIGARETTES, AND MARIJUANA?

We focused on alcohol, cigarettes, and marijuana for several reasons. First, these are the drugs of choice among adolescents. As Fig. 2.1 shows, 64 percent of high school seniors in 1988 were using alcohol, 29 percent used cigarettes, and 18 percent used marijuana. In contrast, adolescent use of other drugs is quite low. In 1988, only 5 percent had used stimulants within the past month, and even fewer had used cocaine or other hard drugs. Of course, even if the percentages of adolescents who are using the hard, illegal drugs is very low, this is still a matter of concern. Nevertheless, far more young people risk harm from use of alcohol, cigarettes, and marijuana.

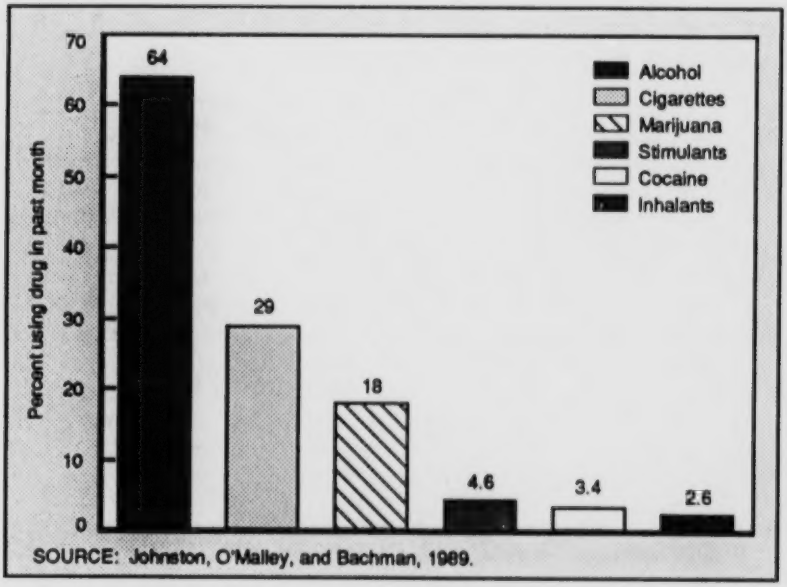

Fig. 2.1—The drugs of choice among high school seniors, 1988

As noted in Section I, the widespread use of these substances poses immediate threats to the health, safety, and development of young people. Given the high costs that smoking and heavy drinking impose on society, it also bodes ill for public resources when the young users become adults.[1]

Moreover, alcohol, cigarettes, and marijuana are the gateway drugs. Research has shown that young people are unlikely to try marijuana unless they have already tried alcohol or cigarettes, and they are even less likely to try hard drugs if they have not already used marijuana.[2] In fact, one study concluded that "prior use of marijuana is necessary for progression to other illicit drugs."[3] Consequently, keeping adolescents from using alcohol, cigarettes, and marijuana not only promotes health and well-being, but may also prevent use of harder drugs.

These facts argue for intervention at the initial stages of drug use, i.e., preventing young people from getting involved with gateway drugs. Post-gateway programs, which attack the problem after patterns of use have already been established, have far less chance of succeeding.

WHAT IS THE STRATEGY OF CHOICE TO CURB ADOLESCENT DRUG USE?

The evidence suggests that adolescent use of alcohol, cigarettes, and marijuana is a matter for serious public concern. The question is, What is the best way to address this problem? In the war on drugs, law enforcement has captured the lion's share of attention and funding. Prevention and treatment, the other major means of combatting the "drug epidemic," have received far fewer resources. On the national level at least, prevention has gotten the shortest shrift.

Yet most people would agree that prevention is by far the most desirable and most appropriate strategy for combatting adolescent use of drugs. Ideally, we would like to stop drug use before it starts; failing that, we want to prevent experimenters from becoming regular users. Treatment should certainly be part of any comprehensive effort to address the problem of adolescent drug use, but treatment comes only after harm has been done.

---

[1]Manning et al., 1989.

[2]Huba, Wingard and Bentler, 1981; Kandel and Faust, 1975; O'Donnell and Clayton, 1982.

[3]Yamaguchi and Kandel, 1984.

Law enforcement is aimed primarily at drugs that few adolescents use. Moreover, it has not proved successful in wiping out the supply of illegal substances.[4] Criminal sanctions undoubtedly restrict teenage demand for illicit substances, but the drugs adolescents use most are legal.[5] Solutions such as arresting and incarcerating millions of young people for underage drinking and smoking—or for using marijuana—would obviously be inappropriate.

DEVELOPING PREVENTION PROGRAMS FOR ADOLESCENTS

While prevention programs appear to offer the most hope for curbing adolescent drug use, early research and demonstration programs largely failed to provide an effective model.[6] Consequently, parents, schools, and community groups have lacked solid guidance about several important issues to be considered in the development of drug prevention programs: (1) identifying techniques that may succeed in keeping young people from getting involved with drugs; (2) determining when adolescents are ready for drug prevention programs; (3) the relationship between program success and public attitudes about particular drugs; (4) the ways drug prevention programs might affect adolescents who are already users.

What Strategies Succeed?

Two drug prevention models have been widely tried and found wanting: the information model and the affective model. Prominent during the 1960s, the information model assumes that adolescents use drugs because they do not know the negative effects, and that understanding the legal and medical consequences will keep them from becoming users. In fact, these programs frequently do increase students' knowledge about drugs, but they have been less successful in changing students' attitudes and not at all successful in changing their drug-using behavior.[7]

This failure reflects the fact that knowledge alone rarely changes behavior. Many of the information programs also failed because they exaggerated the harmful effects of drugs. Predictably, such scare

[4]Polich, Ellickson, Reuter, and Kahan, 1984; Reuter, Crawford, and Cave, 1988.

[5]It is illegal to sell alcohol and cigarettes to minors, but the substances themselves are legal.

[6]Goodstadt, 1986; Moskowitz, 1989.

[7]Goodstadt, 1978, 1981.

tactics undermined the credibility of the programs and the people who conducted them. A whole generation of young people reacted to the hyperbolic propaganda of the 1960s by rejecting any information about the problems associated with marijuana.

The affective (or general-skills) model became popular during the 1970s. It assumes that adolescents use drugs to compensate for low self-esteem or because they have not developed effective communication and decisionmaking skills. This approach tries to bolster adolescents' self-esteem by helping them clarify their values and develop those skills. But it implicitly fails to recognize two important issues: (1) raising a young person's self-esteem is a complex task that is not likely to be accomplished by a short-term program; (2) it is not clear that adolescents readily make the connection between broad decisionmaking skills and their own actions in specific pressure situations. Moreover, many educators avoided any mention of drugs in the classroom because they did not want be tarred with the propaganda brush that made the information programs lose credibility. Consequently, most of the affective programs also failed to reduce drug use.[8]

The approach to drug prevention that appears to hold the most promise for adolescents is the social influence model, which has already produced encouraging results in anti-smoking programs.[9] Several of these programs have reported reductions in cigarette use among junior high school students, typically ranging from 20 to 50 percent.

This model views initial cigarette use as a social phenomenon—a response to pro-smoking messages and models presented by peers, adults, and the media. Accordingly, social influence programs try to help young people identify the pressures to smoke, counter pro-smoking arguments, and learn to say "no" when directly offered cigarettes. To provide motivation for saying "no," the programs emphasize the negative effects smoking has on teens *now*, in their daily lives and social relationships. This has more relevance for most teenagers than long-term health effects, which seem as unreal to teenagers as growing old. The programs also try to reinforce group norms against smoking and to dispel beliefs that smoking is widespread, desirable, and harmless.

[8]Ellickson and Robyn, 1987; Goodstadt, 1978, 1981.

[9]See, for example, Botvin and Eng, 1982; Evans et al., 1979, 1981; Flay et al., 1983, 1985; Hurd et al., 1980; Luepker et al., 1983; McCaul and Glasgow, 1985; Murray et al., 1987; Pentz et al., 1989; Perry et al., 1980; Schinke, Gilchrist, and Snow, 1985; Telch et al., 1982.

Behavioral research supports the assumptions of the social influence model and its promise for more general drug prevention efforts. Adolescents typically start using cigarettes, alcohol, and marijuana in a group setting, among their friends or relatives.[10] Before that, they have usually been around peers and family members who use these substances or approve of their use.[11] These social influences are strengthened by the desire of most teenagers to look grown-up and independent. Thus, those who see drug use as an adult activity are inclined to try it.[12]

When Should Drug Prevention Programs Be Offered?

The best time for drug prevention programs to be introduced is before students have started experimenting with or using drugs regularly. Programs based on the social influence model should be offered when adolescents are undergoing the first heavy pressures to start, and when they are cognitively and experientially ready.

Statistics indicate that use of cigarettes and marijuana by seventh and eighth graders is quite low, but it more than doubles by the time students finish tenth grade. Figure 2.2 shows drug use by different age groups in 1985. Clearly, anti-drug programs have more hope of preventing any use in the earlier grades.

Seventh grade appears to be the optimum time for offering programs based on the social influence model. This is the point at which the heavy social pressures start. The use of cigarettes and marijuana more than doubles by age 15, and the use of alcohol more than triples. In addition, most seventh graders have just made the transition that readies them socially and experientially to learn resistance skills. They have left the more sheltered environment of the elementary school and are becoming increasingly vulnerable to peer influences. At the same time, they are beginning to make more decisions on their own and are broadening their network of friends and acquaintances—and thus their exposure to various kinds of peer pressure. They also have a stronger cognitive base for understanding difficult concepts such as internal pressure.[13]

However, middle schools may present a challenge that warrants offering social influence programs sooner. These schools typically

[10]Orive and Gerard, 1980; Friedman, Lichtenstein, and Biglan, 1985.

[11]Kandel, Kessler, and Margulies, 1978; Jessor and Jessor, 1978; Huba and Bentler, 1984; Murray et al., 1983.

[12]Jessor, Chase, and Donovan, 1980.

[13]Ellickson and Robyn, 1987.

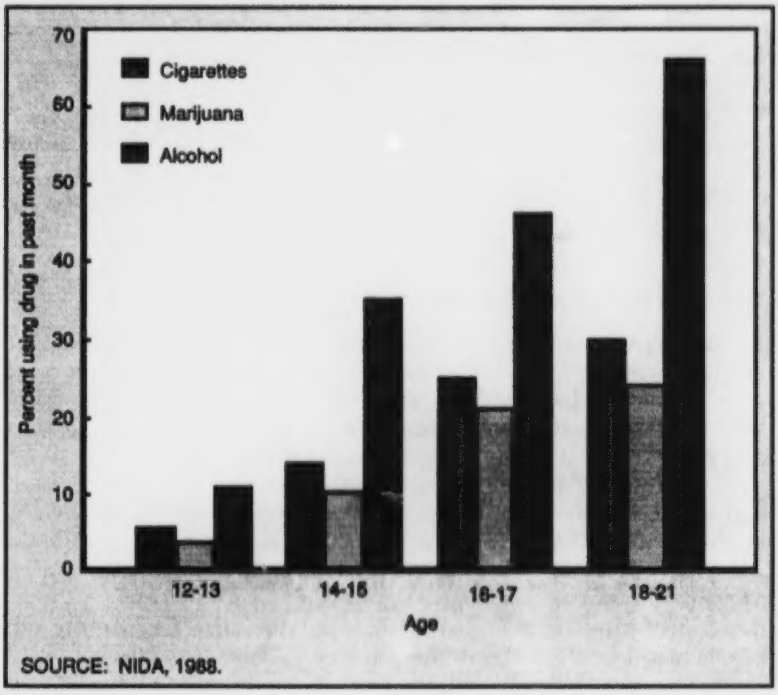

Fig. 2.2—Drug use rates in a one-month period in 1985, by age

include sixth, seventh, and eighth grade classes. Thus, the sixth grader who enters middle school is making the transition that potentially makes him or her vulnerable to pro-drug peer pressures at an earlier age. In such environments, it may be advisable to offer the programs to sixth graders.

How Important Are Public Attitudes Toward Drugs?

The social influence model recognizes that what adolescents believe about particular drugs clearly reflects the way society views their use. All the studies documenting successful smoking prevention took place during a period when public attitudes toward smoking were becoming increasingly negative. This raises the question of whether the success

of the social influence model has largely been a function of this disapproving climate.

In 1964, the Surgeon General made the first official pronouncement linking smoking with lung cancer. Since then, medical research and media reports have flooded the public with evidence that smoking is implicated in many other serious health problems. Tolerance of public smoking has increasingly diminished, as people become more concerned about the effects of passive smoking. Despite advertisements to the contrary, smoking no longer has a chic or sophisticated aura. Under these circumstances, there are few motivations to start smoking and many arguments against it.

Figure 2.2 suggests that the climate for alcohol use is much different from that surrounding the use of cigarettes or marijuana. Social drinking is common and widely accepted in the United States. More people use alcohol, at least occasionally, than any other drug, and in some cultures alcohol has an accepted role in family and religious celebrations. A 1988 survey shows that more than two-thirds of high school seniors believe that regular use of marijuana and cigarettes is harmful, but only 27 percent feel the same way about alcohol. Moreover, only 23 percent disapprove of trying one or two drinks, whereas 61 percent disapprove of trying marijuana.[14] Not surprisingly, then, a much higher percentage of those in each age group have tried alcohol.

How Might Prevention Programs Affect Confirmed Users?

Prevention programs are intended to stop drug use before it starts and to keep experimenters from making the transition to regular use or abuse. Programs based on the social influence model attempt to alter an entire cohort's norms about substance use, e.g., to persuade teenagers that drugs are not the route to popularity and independence and that most young people do not, in fact, use them.

However, confirmed users may not respond to such a message. They typically have more stable—and thus more resistant—motivations for using drugs than nonusers and experimenters.[15] Those who have publicly proclaimed their deviant status and pressured others to start may even react negatively to a message that undermines the user image: Adolescent smokers, for example, tend to discount the negative consequences of cigarette use, to band together

[14]Johnston, O'Malley, and Bachman, 1989.
[15]Chassin, 1984.

with other smokers, and to flaunt their differences from the majority.[16] Some anti-smoking studies have in fact reported boomerang effects for early smokers.[17] These considerations suggest that users are less receptive to prevention efforts than nonusers and experimenters. They also suggest that program results should be assessed separately for each group.

In sum, we have attempted to develop a curriculum that adapts the social influence approach to the prevention of alcohol and marijuana use as well as use of cigarettes, and to tailor it to the experiential, developmental, and social situations of seventh and eighth graders. In so doing, we tried to overcome the limitations of earlier efforts in the design and evaluation of prevention programs.

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[16]Gordon, 1986.
[17]Botvin, 1987.

III. PROJECT ALERT: CURRICULUM, EXPERIMENTAL DESIGN, AND EVALUATION

OVERVIEW OF THE CURRICULUM[1]

Project ALERT seeks to develop adolescents' motivation and skills to resist pressures to use drugs. It strengthens motivation by helping young people to formulate reasons for not using, to recognize that most of their peers do not use drugs, and to believe that they can successfully resist. It builds resistance skills by helping adolescents to recognize both internal and external pressures and by having them practice different ways to say "no."

The program uses question-and-answer techniques, role modeling, and repeated skills practice to enhance student participation and learning. These strategies allow teachers to adjust program content to classrooms with different levels of information and drug exposure.

The seventh grade curriculum consists of eight weekly sessions, each lasting one classroom period. The eighth grade curriculum consists of three booster sessions, intended to reinforce the lessons learned in seventh grade and reduce the erosion of resistance skills. The booster sessions also strengthen motivation by introducing new reasons for not using drugs and new ways to help friends resist. The highlights of the curriculum are summarized below.[2]

Sessions 1 and 2: Motivating Drug Resistance

- Students answer questions about how specific drugs "can affect you."
- Teacher corrects myths.
- Videos illustrate short-term consequences of using.

Sessions 3 through 5: Building Resistance Skills

- Teacher asks students where pressures come from.
- Students model what internal pressures are like.

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[1]See Ellickson et al. (1988) for a detailed discussion of the experimental design and curriculum. A technical discussion of the program's results is given in Ellickson and Bell, 1990.

[2]Appendix A discusses each session in more detail, showing how we translated the theoretical guidelines into concrete activities.

- Students rewrite substance advertisements to tell the "real truth."
- Videos and posters demonstrate different ways to say "no."
- Students act out successful solutions to pressure situations.

Sessions 6 through 8: Reinforcing Resistance Motivation and Skills

- More practice saying "no"—student skits, written scenarios.
- Students create posters listing benefits of resistance.
- Older teens on video discuss how they have resisted.

DEVELOPING THE PROJECT ALERT CURRICULUM

We adapted the social influence model in three specific ways:

- We provided a coherent theoretical framework to guide curriculum content and delivery.
- We addressed the beliefs and circumstances that lead children to begin experimenting with *each* substance—alcohol, tobacco, and marijuana.
- We assisted students in identifying and resisting *internal*, as well as external, pressures to use drugs.

Providing a Theoretical Framework

To help us structure curriculum content and delivery, we drew on relevant research in two areas: the Health Belief Model (HBM) and self-efficacy theory.[3]

The HBM guided content development. As applied to drug use, this model assumes that teenagers' motivation to resist pro-drug pressures stems from their beliefs that (1) taking drugs has bad personal consequences, (2) they can avoid those bad consequences if they resist, and (3) the benefits of resisting outweigh the costs.[4] The Project ALERT curriculum fosters these beliefs through material and activities designed to persuade students that drug use has serious consequences, that they are susceptible to them, and that avoiding those consequences is among the benefits of resistance. The HBM also assumes that barriers to resistance must be removed before

[3]See Ellickson, 1984a, 1984b, and Ellickson et al., 1988, for a full discussion of the curriculum's theoretical basis.

[4]Becker, 1974; Janz and Becker, 1984; Rosenstock, Strecher, and Becker, 1988.

people can act on their motivations. One barrier is the belief that resistance is difficult and rarely successful. The curriculum seeks to lower that barrier by showing students examples of effective resistance skills and by convincing them that they can master those skills. It also points out that most people do not use drugs: Resistance, not use, is the norm.

To motivate resistance, the curriculum builds on the insights of cognitive psychology. Rather than simply listing costs and benefits, it helps students assimilate and make sense of new information by drawing on ideas they already have and making connections between the classroom lesson and their real-life experiences.[5] The Project ALERT teachers asked students to focus on consequences that they themselves considered serious and likely to happen to them if they used drugs (e.g., problems drug use could cause in their daily lives and social relationships). Students were asked to express their beliefs about "how drugs can affect you" and the "good things you get" from resisting pressures to use drugs.

The way the curriculum is presented is potentially as important as the content itself in motivating students and building their resistance skills. Self-efficacy theory supports this view, postulating that self-efficacy is essential for effective action—believing that you can accomplish a task is a necessary condition for success. Indeed, self-efficacy affects "whether people even consider changing their behavior, how hard they try..., and how well they maintain...the changes they have achieved."[6] For our purposes, believing they can resist pressures to use drugs should motivate and help students to learn resistance skills and to apply them successfully.

Research has identified several methods of enhancing self-efficacy.[7] We used the following methods in the Project ALERT classrooms:

- Stating explicit, near-term goals
- Promoting accomplishment through active participation and practice
- Providing models of successful behavior
- Reinforcing and validating successful performance
- Respecting students

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[5]Collins, Brown, and Newman (in press); Lave, 1988; Resnick, 1987.

[6]Bandura, 1984, p. 133.

[7]Bandura, 1977a; Bandura, 1977b; Bandura, 1985; Bandura and Cervone, 1983; Bandura and Schunk, 1981; and Bandura and Simon, 1977.

Stating explicit, near-term goals. By providing clear guides for tasks to be accomplished "here and now," short-term goals foster achievement of larger future objectives. We applied this concept by dividing each program session into discrete segments, with announced goals for each segment. For example, the teacher would tell students explicitly, "Now we'll learn how to say 'no' when someone offers us pot."

Promoting accomplishment through active participation and practice. Research suggests that self-efficacy is most effectively enhanced by trying out the desired behavior and succeeding at it.[8] Research also indicates that adolescents learn new content and skills better when they participate actively in the educational process. Project ALERT applied these principles by getting students involved rather than lecturing them. Techniques include question-and-answer sessions, small-group discussions, individual and group role-playing, and writing exercises. The program emphasizes activities that involve practicing resistance skills. For example, several "trigger" films call for group skits in which students act out successful "saying no" solutions before seeing the filmed solutions. Other written and role-playing exercises call for individual practice.

Providing models of successful behavior. Social learning theory holds that young people learn new behaviors by observing (and later imitating) what others do.[9] We provided models of successful resistance to drugs in at least three ways. First, many of the activities described above involve modeling. For example, as students act out different ways of saying "no," the rest of the class sees a successful model for resisting drug pressures. Second, the classroom teen leaders and teachers are "live" models of effective resistance who personify the benefits of resisting and provide their own examples of how it can be done. Third, the teens in several films discuss how and why they have abstained from using drugs and act out solutions to the trigger films.

Reinforcing and validating successful performance. Self-efficacy is also enhanced when people believe they are acquiring the skills they need and are equal to the task. The Project ALERT teachers and teen leaders used verbal persuasion to reinforce students' beliefs that they were learning resistance skills and would be able to apply them. Several reinforcement techniques were used—for example, teachers and teen leaders praised students for specific contributions to discus-

[8]Bandura, 1985.
[9]Bandura, 1977a.

sion and repeated their solutions. They also "validated" students' perceptions by acknowledging voiced concerns that pressures to use drugs are powerful and resistance can be difficult. Acknowledging these problems supports the legitimacy and importance of the program. After all, why would students have to be taught these skills if resistance were easy?

Respecting students. Students can hardly believe in their self-efficacy if they are not treated with respect. Respect also enhances students' receptivity, motivation to learn, and identification with the teacher. In Project ALERT, health educators and teen leaders acknowledged students' freedom of choice, listened to their opinions, and abided by ground rules they had established mutually with the students—for example, never repeating confidential statements outside the classroom and no "put-downs."

Providing Specific Information About Each Substance

We tailored the content of the program for specific drugs. Demonstrating that cigarette use has declined dramatically or showing its negative effects may not carry over to student attitudes toward alcohol or marijuana. We also needed to address the reasons for adolescents being attracted to those drugs and the effects that using them can have.

The Project ALERT curriculum includes exercises that focus on why people use or refuse to use a particular substance, how their use affects themselves and others, and how to identify and counter messages in cigarette and alcohol ads. We also developed posters and original films to amplify these exercises. One film, for example, dramatizes the consequences of using marijuana at a party. Another shows teenagers discussing the benefits of resisting pressures to smoke, drink, and use marijuana.

Helping Students Recognize and Counter Internal Pressures

Before developing the curriculum, we conducted a series of discussions with junior and senior high school students to gain insights into the pressures they face. We divided the students into user and nonuser groups to discuss why they did or did not use specific substances, how they got started, in what circumstances they used different drugs, and what helped them resist.

The discussions revealed two important points: First, although many students insisted that no one forced them to do drugs, they all

felt pressured to use. On closer questioning, they indicated that this pressure was internal. It reflected subtle beliefs such as, "I'll be left out if I don't act like the others," "I'm bored," or "doing drugs will make me look cool." And second, high school students can identify these internal pressures, but junior high school students cannot. Neither their experience nor their cognitive development equips them to identify their beliefs about the benefits of trying drugs or to see how these beliefs generate internal pressures to experiment.

To address this lack of self-awareness, we designed exercises to help seventh and eighth graders identify and resist internal pressures. For example, short psychodramas showed these pressures from within, graphically demonstrating the thoughts students might have when tempted to use drugs. Exercises helped students identify the different sources of pressure and pointed out how they worked. We also stressed learning to say "no" to both internal pressures and direct offers of drugs.

EXPERIMENTAL DESIGN

We designed Project ALERT specifically to overcome problems that raise questions about the generalizability of previous prevention studies. Most evaluations of prevention programs have been conducted in homogeneous settings—primarily white, middle-class suburban communities with few minority students.[10] Many evaluations have also suffered from lack of random assignment, faulty implementation, and failure to assess the accuracy of self-reported drug use.[11] Although these evaluations provide useful information, program effects can be questioned. They may reflect characteristics of the environment as much as or more than features of the programs.

To avoid these limitations, we selected 30 schools from eight school districts in California and Oregon that represented a range of community environments, racial and ethnic groups, and socioeconomic levels. Located in urban, suburban, and rural settings in the northern and southern regions of the two states, nine of the schools had minority populations of 50 percent or more. Eighteen schools drew students from neighborhoods with household incomes below the state median. They also covered the three major grade spans for this age

[10]Botvin and Wills, 1985; Flay, 1985.
[11]Biglan and Ary, 1985; Moskowitz, 1989.

group: 6–8, 7–8, and 7–9. This diversity ensures that the program was not tested solely in either favorable or unfavorable environments.

We *randomly assigned the schools to three experimental groups.* To enhance the balance among the conditions, we matched the 30 schools on geographic, socioeconomic, and other characteristics, as well as previous drug use among students. These and other procedures largely ensure that differences in drug use among the groups can be attributed to the program, not to school-level characteristics.

In 20 of the schools, all seventh grade students received the anti-drug curriculum, but the delivery varied: In half of these schools, classes were taught by a teacher alone; in the other half, teen leaders assisted the teacher. In the remaining 10 schools, the Project ALERT curriculum was not delivered. These schools provided a control group against which we measured program outcomes.[12] When students in the treatment groups reached eighth grade, they were given a booster program, a technique that other studies have found to enhance program effects.[13]

We tested the teen-leader component because several studies have reported that better results were obtained when classroom delivery included peer leaders.[14] We chose older teens rather than same-age peers because the older teens have more experience in coping with social pressure. As role models for successful nonuse, their primary function was to provide personal examples of effective resistance and to help students believe that they, too, could successfully resist drugs.

EVALUATING PROGRAM EFFECTS

In our evaluation of Project ALERT, we strove to isolate the effects of the curriculum from other influences that might reasonably explain those effects. One of those influences is the quality of program implementation.

The way in which an experimental program is implemented can affect its outcomes as much as its design does. Because of the importance of ensuring that the program was implemented faithfully, we

[12]Four of the control schools had existing anti-drug activities that involved seventh and eighth graders. All four took an informational approach, giving students facts about drug use and its effects. Because the schools were allowed to continue these programs, the experiment provided a more stringent test of Project ALERT's effectiveness than would have been provided by comparison with schools that had no prevention programs.

[13]Botvin, Renick, and Baker, 1983.

[14]Tobler, 1986.

stressed the necessity of adhering to the curriculum's content and delivery style. We also monitored 41 percent of the program sessions and collected classroom logs for every lesson.

As a result of these efforts, we believe the effects revealed by the evaluation reflect the curriculum and the social influence model underlying it rather than any vagaries of program delivery. Every one of the 2,300 scheduled classes was presented, and in 92 percent of the observed classes, all lesson activities were covered.[15]

Obtaining Accurate Reports of Substance Use

We collected data on drug use and related characteristics from students in all three groups—the schools using teen leaders, the schools using teachers only, and the control schools. As Fig. 3.1 shows, students filled out questionnaires in the classroom at four points during junior high school: before and after delivery of the seventh grade curriculum (waves 1 and 2); before and after the eighth grade booster sessions (waves 3 and 4).[16]

The questionnaires elicited information on personal use of alcohol, cigarettes, and marijuana—lifetime use, most recent occurrence, frequency of use within the past month and year, and amount used. Respondents were also asked about use of stimulants, depressants, cocaine, and "other drugs."[17] In addition, students were asked about their beliefs, perceptions, and future intentions concerning drug use; drug use in their families and peer group; their backgrounds; and their behavior and personality. Appendix B lists topics other than personal substance use that were included in the baseline survey.

For adolescents, buying alcohol and cigarettes is as illegal as use of marijuana. Consequently, people often question whether self-reports can be trusted and whether students will tell the truth. Other studies have shown that drug use reports are quite accurate when young respondents trust guarantees of confidentiality.[18] Hence we took several steps to ensure data privacy—and to remove impediments to accurate reporting.

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[15]See Ellickson et al., 1988, for a detailed discussion of the strategies we employed to ensure faithful implementation and how they have worked.

[16]We are also collecting data from the students when they are in grades nine, ten, and twelve. We do not present outcomes during the high school years because we have not completed our analysis of the data. These outcomes will be presented in a future report.

[17]As the students matured, specific questions about use of PCP, LSD, other psychedelics, and inhalants, as well as polydrug use, were added.

[18]Single et al., 1975; Williams et al., 1979.

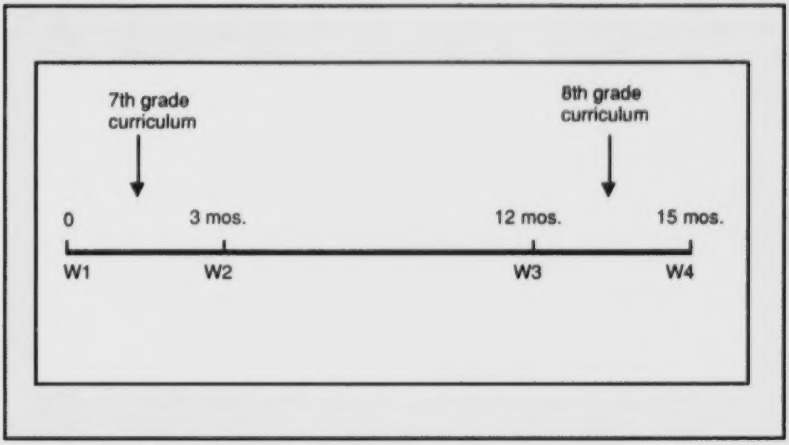

Fig. 3.1—Data collection and program delivery schedule

First, the data collectors followed a strict protocol that stressed the importance of telling the truth and described the extensive measures that had been taken to protect data privacy. These measures included preventing parents, teachers, and other nonresearch personnel from seeing student responses; identifying student surveys by number, not name; and obtaining a certificate of confidentiality from the Department of Health and Human Services that prevents people (in public capacity or for personal reasons) from successfully filing suit for disclosure of individual data.

Second, we collected a saliva sample from each student immediately before he or she answered the questionnaire. We informed the students that tobacco and marijuana use can be detected in saliva, and that the samples would be tested, which they were. Such procedures have been found to improve the accuracy of reported cigarette use among adolescents.[19]

Third, all students were given the opportunity to refuse to participate in data collection.

[19]Bauman and Dent, 1982; Murray et al., 1987. The samples were tested for the presence of cotinine, a metabolite of nicotine, which can be detected for up to three days after use of tobacco. We did not test for marijuana traces because the tests are not as reliable and cannot detect use after 12 hours.

Fourth, most of the questions had been successfully used in national surveys of adolescent drug use. Where necessary, we modified them to accommodate the reading levels and experience of seventh and eighth graders.

Several measures attest to the success of our efforts to encourage participation and truthfulness. First, less than 1 percent of the students refused to fill out a questionnaire at baseline. That proportion remained constant throughout the next three waves, indicating that most students did not feel threatened by the data collection process. Second, less than 1 percent of the students who denied using tobacco were contradicted by the saliva test. Moreover, 95 percent with positive saliva tests admitted to recent smoking or use of other tobacco products. Third, the proportion of students who changed their stories about having used a substance and later denied use was small, averaging about 5 percent. Finally, we found no evidence that those in the treatment groups reacted to the experiment by distorting their reports.

Total baseline nonresponse amounted to 14 percent, mostly attributable to parent refusals of informed consent (9 percent) and absence (3 percent). Because the largest group of nonrespondents closely resembled respondents, nonresponse at baseline had little effect on sample characteristics or pretreatment equivalence.[20]

We checked school data and found only two differences between respondents and children whose parents refused to allow them to participate: The latter were more likely to come from Asian families, and they had slightly higher grades. Being Asian and doing well in school are both associated with lower adolescent drug use.[21] This fact is inconsistent with the notion that parents might withhold consent because they know their children are using drugs and they want to avoid exposure.

Learning How the Program Works for Different Risk Groups

As discussed in Section II, we wanted to find out whether the program was equally effective for each substance and for students in different risk groups. Therefore, we analyzed outcomes for each target substance separately and for different risk groups in the sample. Risk groups were determined by students' use of a substance before

[20]Bell, Gareleck, and Ellickson, 1990.

[21]Barnes and Welte, 1986; Chassin, Mann, and Sher, 1988; Jones and Moberg, 1988; Oetting and Beauvais, 1987; Wills, 1986.

they entered the program (at baseline). For alcohol and cigarettes, we defined risk groups as follows:

Nonusers	Never tried
Experimenters	Tried once or twice (but not in the past month)
Users	Tried 3 or more times (or used in the past month)

Outcomes for marijuana posed a special problem. Nonusers of marijuana were a large, heterogeneous group that included some with considerable experience using legal drugs and others with little or no experience. Those distinct groups might react very differently to messages about resisting pressures to use marijuana. Consequently, we distinguished those who had not tried cigarettes by seventh grade from those who had.[22] The third risk group included all students who had already tried marijuana.

Eliminating Differences Among Experimental Conditions

In our evaluation of Project ALERT's effects, we used logistic regression techniques to control for various student characteristics—backgrounds, attitudes, behavior, and environment—that might be confounded with program outcomes. Controlling these factors enabled us to isolate the effects of the program from the effects of other variables.

For example, despite the care we took in matching experimental groups, one group might have a higher proportion of low-risk (or high-risk) students than another. If we failed to control for preexisting differences, the results would suggest that the program was more (or less) effective than it really was.

Differences may also arise through attrition over time. Our analysis is based on 3,900 students who were enrolled during seventh and eighth grades and were thus eligible to receive the full two-year curriculum.[23] They constitute 60 percent of the baseline sample.

[22]The latter were three times as likely to try marijuana within a year as the baseline nonsmokers.

[23]We applied this restriction to ensure that differences in pre- and post-booster outcomes could not be attributed to different samples. Students in the analysis sample also had to supply data on the baseline control variables and the relevant outcome variables at the three follow-up waves.

In general, losing students over time did not affect the balance among experimental conditions, because similar numbers and types of students were lost across all three groups.[24] However, we did find small differences among the three groups in the *expected* amount of substance use that would have occurred in the absence of any intervention. Our statistical techniques eliminated these differences, and the adjusted results may be interpreted as though the control group and the two program groups were identical at baseline.

[24]While attrition did not affect comparisons across experimental groups, it did result in small losses of "at-risk" students. For example, 25 percent of the analysis sample had grades of C or lower, compared with 30 percent for the original baseline sample. Across several risk factors (low grades, lower socioeconomic status, family disruption, early drug use, and other deviant behavior), the change in composition between the two samples averaged only about 5 percentage points. The largest gap, 7 percent, was in the percentage who had tried marijuana.

IV. HOW EFFECTIVE WAS PROJECT ALERT?

Based on prior research and the issues discussed above, we formed several hypotheses about what the analysis would show:

- The program would produce better results in curbing the use of cigarettes and marijuana than it would in curbing alcohol use.
- The program would be more effective for nonusers and experimenters than for users.
- Teen leaders would be more effective than teachers alone.
- The booster sessions would enhance program effects or limit their erosion.

Before presenting the results, we describe the context in which the program was applied, in terms of the participating students' prior drug use.

DRUG BEHAVIOR AND THE PROGRAM'S POTENTIAL

Figure 4.1 shows the level of drug use by our sample of seventh graders at the experiment's baseline.[1] Most of the students (86 percent) had no experience with marijuana. However, only about half (52 percent) had never tried cigarettes and only a quarter (25 percent) had never tried alcohol.

The use rates shown in Fig. 4.1 are considerably higher than those for the national sample of 12- and 13-year olds shown in Fig. 2.2. Thus, Project ALERT's *potential for preventing initiation of drug use* in the sample was not as great as the national data suggested it might be. However, its potential for preventing or reducing future use was still good. Even if the students defined as "users" were already confirmed in their ways, the great majority of those in the sample were either nonusers or experimenters, for whom a prevention-oriented program seemed appropriate. At baseline, 95 percent of

[1]Students were classified as "experimenters" if they had tried a substance once or twice, but not in the past month, and as "users" if they had tried it 3 or more times or in the last month before baseline. The latter condition may seem overly stringent. However, we found that students who had tried cigarettes or alcohol within the past month were in several ways more like the other users and less like the experimenters. Thus, we classified them as users.

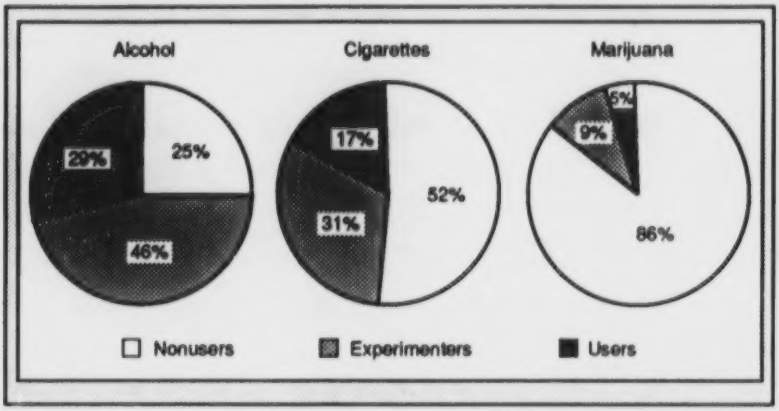

Fig. 4.1—Level of drug use by Project ALERT seventh graders at baseline

the sample had never used marijuana or had tried it only once or twice; more than 80 percent had never used cigarettes or had tried smoking only once or twice; and more than 70 percent were alcohol nonusers or experimenters only.

Our objectives for each group varied. We wanted to keep the nonusers from starting or from using frequently, if they did start. For experimenters and users, our purpose was to cut down on recent use and to prevent frequent or regular use and abuse. Thus, in analyzing program effects, we measured rates of *initiation* for nonusers; *recent use* for experimenters, users, and nonusers; and *frequent and regular use* (monthly and weekly) for experimenters and users. For the experimenters and users, we also looked at rates of quitting, and for cigarettes, we included daily use. Results were analyzed by user group, months after baseline, and treatment group.

RESULTS

The results of our analysis largely confirmed our expectations. Project ALERT was more effective against marijuana and cigarettes than it was against alcohol. It was also more effective for nonusers and experimenters than it was for users. In general, the booster program enhanced program effects or limited erosion. However, the pro-

gram's early effectiveness against the use of alcohol disappeared between grades seven and eight and did not reappear after the booster sessions. And while the teen-leader group frequently had less substance use than the control group, the teen leaders were not more effective than adults alone.

The control group provides the base against which we measured Project ALERT's effects on students in the teen-leader and teacher-only groups. As explained in Section III, we controlled for other differences that might affect substance use. Thus, the results may be interpreted as if the groups were identical at baseline. The most significant results are summarized below. The complete results of the logistic regression analyses for each substance are given in Appendix C.

When Project ALERT Was Effective

Project ALERT was consistently effective against marijuana use. It not only curbed initiation, it also held down frequent (monthly) use among students who had already started smoking cigarettes. These effects appeared nine months after exposure to the seventh grade curriculum and were maintained by the booster lessons.

The program was most effective for lower-risk students, that is, those who had never smoked or used marijuana before Project ALERT. In the control schools, about 8 percent of the students began using marijuana within a year (Fig. 4.2). By 15 months, that proportion had risen sharply, to 12 percent. In the treatment schools, however, one-third fewer Project ALERT students began using—even before they received the eighth grade booster lessons. The reductions were roughly the same for students in the teacher-only and teen-leader schools. The booster program appeared to maintain the results, keeping the reduction in the Project ALERT schools close to one-third.

For lower-risk students who did begin using, Project ALERT also curbed recent use (i.e., use in the past month). Students in the schools where the program was conducted by teachers only were almost 50 percent less likely than the control students to be users by eighth grade. Further, the reduction increased to over 60 percent after the booster sessions. The schools in which teen leaders were used also showed lower recent use, but the differences between them and the control schools were not statistically significant.

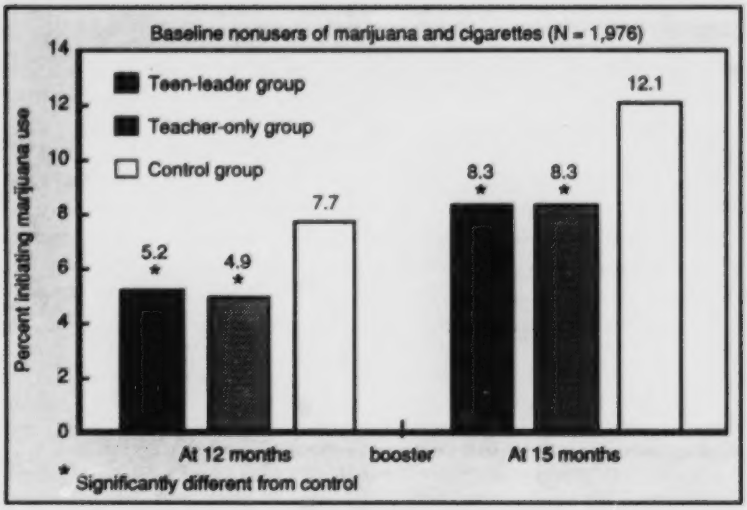

Fig. 4.2—Effects of Project ALERT on initiation of marijuana use

Project ALERT did curb frequent marijuana use in the high-risk groups (students who had tried cigarettes, but not marijuana, at baseline and baseline marijuana users), but the effects were smaller and less often statistically significant. Students in the high-risk groups were substantially more likely to use marijuana later on than those who had never tried either marijuana or cigarettes by grade seven. Compared with baseline nonusers of both substances, for example, those who had tried cigarettes were three times more likely to start using marijuana within a year. Nevertheless, Project ALERT reduced frequent marijuana use within this group by 50 percent by eighth grade in the schools where the sessions were presented by teachers only.

For baseline users in the teen-leader schools, weekly marijuana use was 50 percent lower one month after receiving the program than it was for users in the control schools. While that reduction had almost disappeared by the time the students entered eighth grade, the booster program recouped some of the loss (Fig. 4.3).

Project ALERT significantly curbed frequent and heavy smoking by students who had experimented with cigarettes.

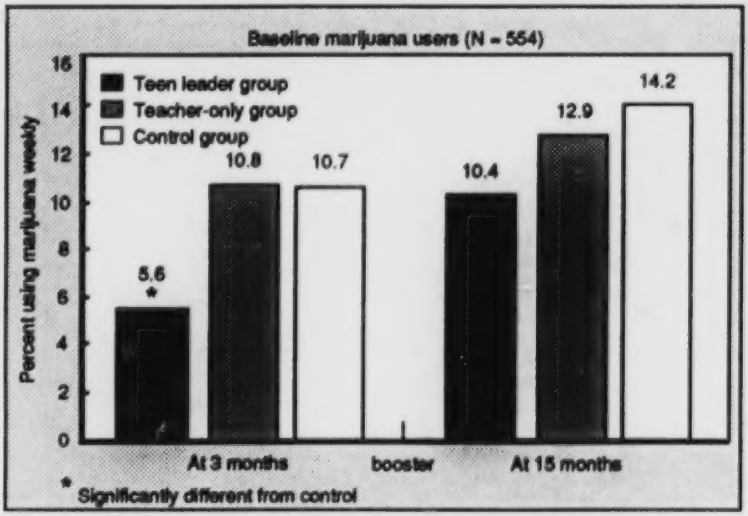

Fig. 4.3—Effects of Project ALERT on marijuana use by high-risk students

Figure 4.4 shows the percentage of experimenters who had smoked cigarettes in the past month or had reported monthly use, 15 months after baseline. For both kinds of use, the rates at the Project ALERT schools were lower, and the differences were, with one exception, statistically significant. These positive results generally did not show up until after students had been exposed to the booster program (at 15 months).

The booster sessions really paid off for levels of smoking that indicate serious use among young adolescents. As Fig. 4.5 shows, experimenters in the teen-leader schools had almost 50 percent lower rates of weekly use than the control group. Those in the teacher-only schools were one-third less likely to be weekly smokers. In addition, between 12 and 15 months (not shown), there was a small, but absolute, decrease in weekly use in both the teen-leader and teacher-only groups. Project ALERT also substantially curbed daily smoking, which may signal addiction in this young population. In the teen-leader schools, the rate of daily use dropped absolutely during that period and was more than 50 percent lower than the rate of daily use in the control schools.

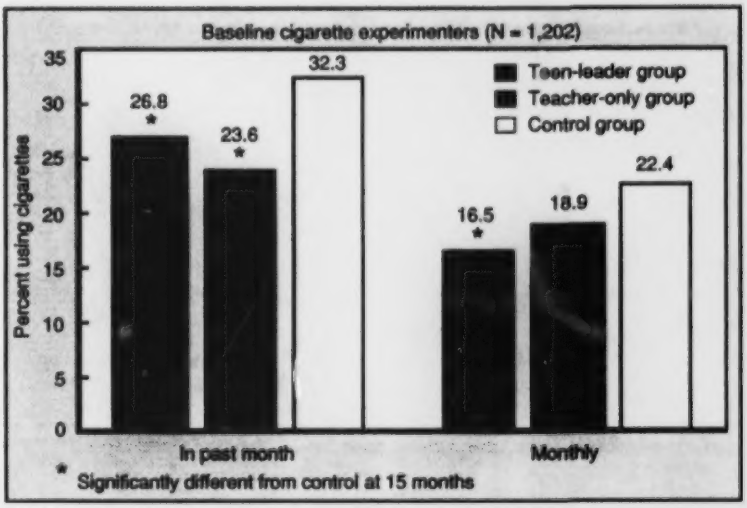

Fig. 4.4—Effects of Project ALERT on smoking among students who had tried cigarettes

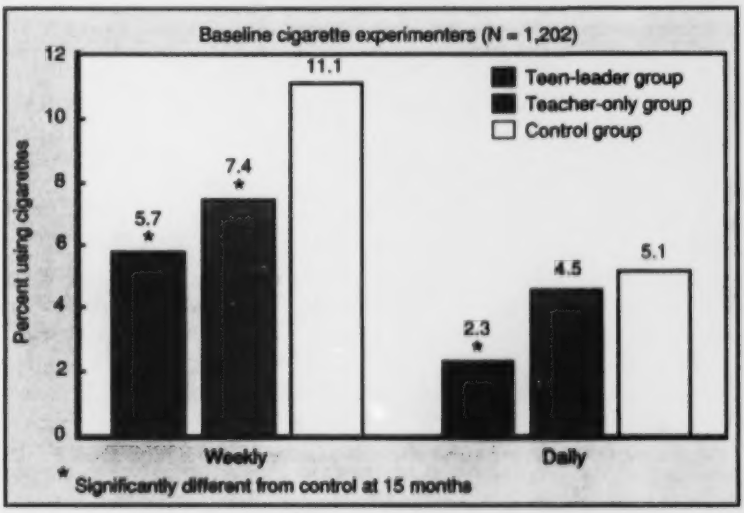

Fig. 4.5—Effects of Project ALERT on smoking that may signal addiction

Finally, by 15 months, Project ALERT positively affected quitting smoking. A significantly higher percentage of experimenters had stopped smoking for at least a year in both the teen-leader and teacher-only schools than in the control schools (50 and 55 percent, respectively, versus 44 percent).

Project ALERT was as successful in schools with high minority populations as it was in predominantly white schools. To test whether the program was effective in schools that did not have predominantly white, middle-class populations, we subdivided our sample into two groups: (1) three districts (13 schools) with high minority populations, i.e., at least 30 percent nonwhite in each school; and (2) five districts with 90 percent or more white enrollment. Treatment effects were similar for both groups, but where they differed significantly, the program had better effects in the high-minority schools. This tendency appeared most often for the two lower marijuana risk levels.[2]

Where Project ALERT Was Less Effective

Right after the seventh grade sessions, Project ALERT produced modest reductions in alcohol use by students at all three risk levels—nonusers, experimenters, and users. For example, compared with the controls, 28 percent fewer students in the teen-leader schools had initiated drinking three months after baseline (Fig. 4.6). By the time they reached the eighth grade, however, fully half of the students in both the control and treatment schools had tried alcohol. Moreover, the early gains for experimenters and users also disappeared between grades seven and eight, and the booster program did not reverse the slide. *Drinking at all levels continued to rise about equally for all three groups.* These results for alcohol use were disappointing but not unexpected, given that use of alcohol is so prevalent and is socially more acceptable than use of cigarettes or marijuana.

Project ALERT's favorable results for cigarettes were limited to reducing future smoking among experimenters. The program did not prevent initial experimentation, which is pervasive among adolescents. Roughly the same percentage of nonusers in the treatment and the control schools succumbed to pressures to "just try smoking."

[2]We also investigated whether the program was more effective for minorities or nonminorities within mixed-race schools. Our statistical tests found no evidence of a difference in either direction.

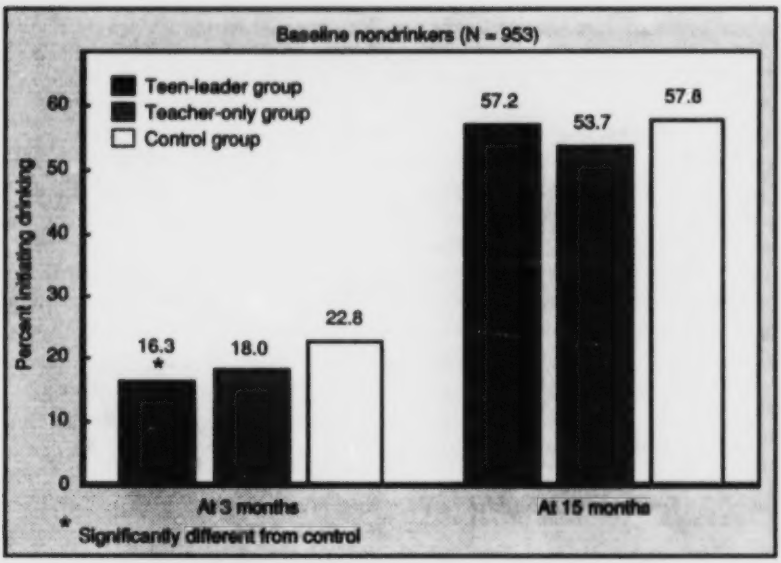

Fig. 4.6—Erosion of Project ALERT effects on drinking by eighth grade

Finally, as the experience of some other evaluations might have predicted, *Project ALERT was not effective for students who were confirmed smokers at baseline.* In fact, their smoking increased. Ironically, this boomerang effect was stronger for students in the teen-leader schools. In the control group, current and monthly use remained fairly steady over time, actually dropping a little between 3 and 15 months. At 12 months, use rates in the teen-leader schools were higher than rates for the control group. As Fig. 4.7 shows, this effect persisted after the booster program (rates in the teen-leader schools were 24 to 30 percent higher than in the control group). While weekly use increased for all three groups over time, the proportion of weekly users was highest in the teen-leader schools. Daily use was also higher in these schools, but not significantly so.

Several things may help explain this finding. First, the smokers were more likely to discount information about the negative consequences of cigarette use. By seventh grade, they had already developed strong pro-smoking beliefs and attitudes (Table 4.1). Fifty-four

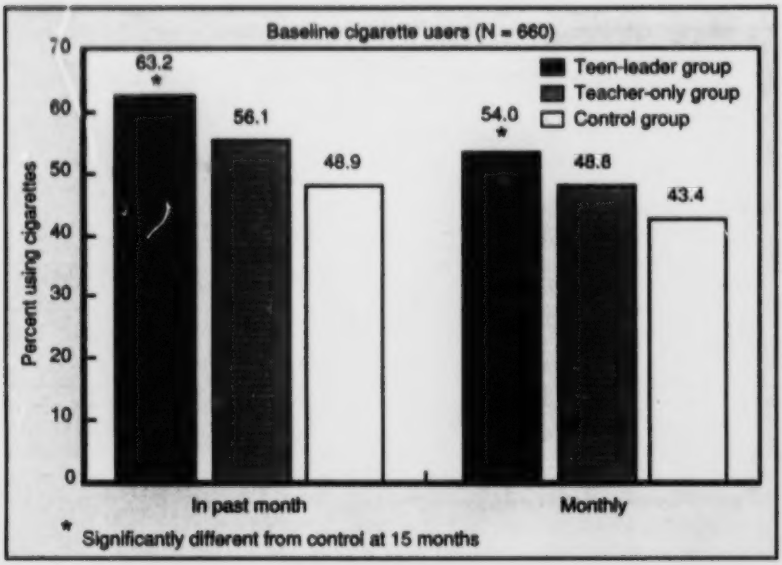

Fig. 4.7—Boomerang effect of Project ALERT on confirmed smokers

percent intended to smoke in the future; nearly 30 percent believed smoking was not harmful; and 44 percent thought it was relaxing. Among experimenters, the comparable figures were 6, 17, and 12 percent, respectively.

Second, baseline smokers were much more likely than nonusers and experimenters to have a network of friends who smoke, drink, and use marijuana. Asking them to resist pro-smoking pressures meant asking them to reject the values—and possibly the company—of their chosen peer group. Third, the smokers were more deviant than the nonsmokers and experimenters in other ways. More of them had stolen something from a store, skipped school, gotten poor grades, and suffered impaired or disrupted family relationships. To the extent that they flaunted their deviance by exhorting others to smoke, the curriculum might well have estranged them from the nonusing majority and reinforced their associations with other deviant peers. In retrospect, it is not surprising that so few heeded the message and that some reacted negatively.

Table 4.1

HOW CONFIRMED SMOKERS DIFFER FROM NONSMOKERS AND EXPERIMENTERS

(In percent)

Baseline (Preintervention) Characteristic	Baseline Level of Cigarette Use		
	Nonusers (N = 1,990)	Experimenters (N = 1,202)	Users (N = 660)
Beliefs about cigarettes			
Intend to use in future	1	6	54
Smoking is not harmful	9	17	28
Smoking is relaxing	8	12	44
Smoking environment			
Best friend smokes sometimes	8	22	65
Around peers who are smoking	8	25	70
Other problems			
Parents divorced, do not live together	26	41	46
Trouble communicating with parents	28	42	57
Student has stolen from a store	9	23	42
Student has skipped school	8	15	34
Student has grades of C or lower	16	30	40

But why did Project ALERT have negative effects on cigarette users and not on alcohol and marijuana users? The alcohol users were less extreme than the cigarette smokers on these measures, reflecting the fact that exposure to pro-drinking models and attitudes is the norm for students in general.[3] They were not as committed to drug use, and they were less likely to be enmeshed in a deviant lifestyle. Being less differentiated from the majority, they had less to defend and fewer reasons for feeling threatened by a prevention program.

For marijuana, the explanation is less clear-cut. The highest-risk group included both marijuana experimenters and a smaller group of more confirmed users. Perhaps negative effects for the latter were masked by this aggregation. However, separate analyses for the two subgroups indicated that the trend toward reduced use in the treat-

[3]The great majority of students had at least one parent who drinks (67 percent). By the eighth grade, a substantial group had an older sibling or best friend who "drinks sometimes" (45 and 54 percent, respectively). Only 10 percent thought their friends would disapprove and would stop being their friends if they drank.

ment schools was equally strong for both users and experimenters—despite the fact that the marijuana users resembled cigarette users in their beliefs about drugs, their peer associations, and their overall lifestyle. What appeared to distinguish them from the smokers was how quickly they became "hooked" and their likely visibility as a group: By eighth grade, the proportion of marijuana users who had progressed to weekly or daily use was smaller than the proportion of smokers who had become weekly or daily cigarette users. In addition, young marijuana users have more reasons to avoid making a public show of their behavior and are less likely to form a visible subculture. Thus they also have less to defend.

V. CONCLUSIONS AND IMPLICATIONS FOR FUTURE PREVENTION EFFORTS

Our results indicate that programs based on the social influence model of prevention can play an important role in reducing adolescent drug use. The study also revealed what such programs should not be expected to accomplish and suggested how they might be tailored to particular groups. This section presents our conclusions and discusses their implications for policy and program design.

CONCLUSIONS

Project ALERT achieved most of its prevention goals, and it also allowed us to evaluate whether and why similar programs are likely to be effective. Our results led to the following conclusions about the social influence model and its potential for drug prevention:

The social influence model merits implementation in the nation's middle and junior high schools.

The findings of this study provide strong empirical support for implementing social influence drug prevention programs in schools with highly diverse student populations in urban, suburban, and rural areas. Project ALERT curbed adolescent use of cigarettes and marijuana, had significant effects for both low- and high-risk students, and reduced experimental and more regular use. Moreover, it worked equally well in schools with substantial proportions of minority students and schools with primarily white, middle-class students. In some cases, it worked even better in the high-minority schools.

In sum, the experiment demonstrated that programs based on the social influence model can delay or reduce use of these "gateway" drugs during a particularly vulnerable period of adolescence and can do so across a variety of demographic and socioeconomic groups.

Social influence programs are most effective when the prevailing social context reinforces their messages.

Project ALERT was most effective in situations where social attitudes backed up the message. Specifically, it was more effective in curbing cigarette and marijuana use than in preventing or reducing

alcohol use. Both cigarettes and marijuana have become less accepted in recent years: Most Americans do not use them and have become less tolerant of their use. This is not the case for alcohol. While less than 10 percent of the adult population are heavy drinkers, about two-thirds drink occasionally.[1] "Social" drinking is widely practiced and tolerated.

The results of the Project ALERT study reflect this difference. Students who received the curriculum were considerably less likely to use marijuana after 15 months than students in the control group. Similarly, cigarette experimenters who had Project ALERT were less likely to smoke during grade eight. In contrast, the program's early effects on drinking eroded within nine months.

By eighth grade, nearly 90 percent of the students in our sample had tried alcohol, and 47 percent were current drinkers—rates that approach those for high school seniors across the nation. In addition, the great majority had parents, older brothers and sisters, or friends who drink. Expecting a short-term prevention program to counter such prevailing norms and attitudes is clearly unrealistic. As long as the signals from the media and most adults directly contradict the message, social influence programs are unlikely to realize their potential for curbing adolescent alcohol use.

However, the current climate provides a stronger base for programs aimed at driving under the influence of alcohol, a leading cause of death among teenagers. Just as media campaigns against smoking are clearly related to decreases in cigarette consumption,[2] rates for alcohol-related accidents have dropped for teenagers in recent years since legislative action and publicity programs against drinking and driving have increased.[3] Programs aimed at teenage drinking and driving thus may stand a better chance of being effective than those that target drinking in general.

We would expect social influence programs like Project ALERT to be even more effective if adolescents received consistent messages about the use of alcohol (and other drugs). But achieving consistency requires coordinated efforts by the media, community groups, and parents, as well as schools. Such coordination is difficult, particularly when it involves accepting a loss of advertising revenues or getting the cooperation of adults whose behavior contributes to the problem.

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[1]U.S. Department of Health and Human Services, 1987.

[2]Warner, 1981, 1989; Warner and Murt, 1983.

[3]Decker, Graitcer, and Schaffner, 1988; U.S. Department of Health and Human Services, 1988.

Where such efforts are successful, the potential for reducing adolescent use of alcohol and other drugs will be greatly increased.

Legalizing marijuana and other drugs could undermine prevention efforts.

Because our results indicate the importance of prevailing social norms for prevention, they also have implications for the issue of legalization of marijuana and other drugs. Today's social climate puts enormous pressures on young adolescents to drink. In contrast, there is an underlying disapproval of marijuana use. To shrink that base of disapproval by legalizing marijuana might very well remove an essential precondition for effective prevention efforts in the schools. Changing the legal classification of marijuana, cocaine, or other drugs could convey the message that these substances are now acceptable, thereby weakening current social norms against their use. If legalization increased adult use, the corresponding message to adolescents would be even more damaging.

Adolescents who are confirmed cigarette users need a more aggressive program than the social influence model alone provides.

Project ALERT had consistently positive results for young adults who were originally experimental cigarette smokers. However, it did not help students who were confirmed smokers at the beginning of seventh grade. In fact, it increased use within this group.

This boomerang effect was limited strictly to cigarette use. The program did not increase drinking or involvement with marijuana among confirmed users. But telling young smokers that most of their peers do not smoke and exposing them to nonsmoking role models is a strategy that appears to be irrelevant at best and counterproductive at worst.

Providing lessons on quitting and fostering positive interactions with nonusing peers might improve the program's effectiveness with this group by diluting their commitment to smoking and their associations with other smokers. However, that would not address their deeper problems, of which early smoking is only one symptom. The confirmed smokers in seventh grade were on the fast track to becoming troubled youth: A substantial proportion came from disrupted family environments, were doing poorly in school, and had already started stealing and skipping school. To address these multiple prob-

lems requires earlier, more comprehensive, and more intensive programs than Project ALERT or similar efforts aimed specifically at substance use are able to provide.

Program outcomes alone do not justify the extra time and resources involved in using teen leaders in the classroom.

We expected the program to be more effective when teen leaders were involved in the classroom delivery than when the curriculum was taught solely by adult teachers. That expectation was borne out for cigarette experimenters. But for marijuana and alcohol, neither teaching method exhibited a clear pattern of dominance. And for cigarette users, the teen leaders had a negative effect. Overall, we could not conclude that either delivery mode was clearly superior.

Thus our results do not provide a rationale for the substantially greater investment in recruitment and training required to use teen leaders. However, the teens themselves report that participation in Project ALERT yielded many personal benefits—increased self-esteem, the satisfaction of helping others, and the development of greater communication and leadership skills. School officials need to carefully consider whether the positive effects of having older teens participate in sessions outweigh the comparatively greater expenditure of time and resources required to use them.

Booster programs are critical for extending the effects of social influence programs.

In Project ALERT, the booster component had a high payoff. The booster lessons maintained the effects of the seventh grade program against marijuana use across all the risk groups. In one case, it actually reversed the erosion of effects: Right after the seventh grade program, baseline marijuana users in the teen-leader schools had 50 percent lower weekly use rates than users in the control schools. While that difference had almost disappeared after 12 months, the booster program reinstated some of the earlier gains. For smoking experimenters, the results were more dramatic. Students who had been given the curriculum had lower rates of cigarette use than students in the control schools right after the seventh grade program. However, those differences became statistically significant only after the eighth grade booster. In all likelihood, these gains would not have been realized without the booster sessions.

Our results indicate that it would be a mistake to assume that a prevention program could function as a one-shot, lifetime "inoculation." As time passes, the effects of the classroom experience are likely to fade. Thus booster programs may be critical for extending the effects of social influence programs into high school. Follow-up data when the students reach ninth, tenth, and twelfth grades will give us empirical evidence about how long the program's effects stand up when students do not receive additional booster lessons. If the students who received the curriculum are not still realizing its benefits, it will be necessary to develop and test booster programs for older adolescents.

POTENTIAL BENEFITS OF SOCIAL INFLUENCE PROGRAMS

The potential benefits of programs like Project ALERT are considerable. Smoking accounts for more than one in six deaths in America and is responsible for enormous medical costs and productivity losses.[4] While the public-health costs of marijuana use are less well-documented, recent studies suggest that it too may contribute to lung disease, as well as interfere with the body's immune response and affect reproductive processes.[5]

Curbing marijuana use has positive implications for adolescent development and safety, in both the short and the long term. Small doses of marijuana can impair memory, hamper judgment, distort perception, and diminish motor skills.[6] These effects not only interfere with a young person's ability to learn, they also increase the likelihood of driving accidents and injury. Further, early marijuana use has "a range of negative impacts on the social psychological functioning of the young adult."[7] These include greater job and marital instability, involvement in stealing and drug crimes, increased incidence of psychoses, and abandonment of higher education.

When young people use these gateway drugs, they run the risk of harmful effects and increase their likelihood of using hard drugs. The earlier a person starts to smoke, the harder it is to stop, and the

[4]U.S. Surgeon General, 1989.

[5]Friedman et al., 1988; Specter et al., 1986; Tashkin et al., 1987; Wu et al., 1988; Zuckerman et al., 1989.

[6]Hingson et al., 1982; Institute of Medicine, 1982; Moskowitz, 1985; Peterson, 1984; Yesavage et al., 1985.

[7]Newcomb and Bentler, 1988, p. 206, provides a detailed analysis of the consequences of adolescent drug use eight years later.

greater the risk of illness related to tobacco use.[8] Drug use before the age of 15 puts the user at high risk for dysfunctional drug use and abuse in later years,[9] whereas curbing cigarette and marijuana use at an early age offers the prospect of preventing or delaying progression to other dangerous drugs.[10]

Thus, each year that use of these substances can be delayed or reduced represents an important gain. It provides additional breathing space for young people to develop the coping skills needed for becoming productive adults; reduces their risk of becoming dependent on cigarettes, marijuana, or other drugs; and lowers their likelihood of experiencing health and social problems related to the use of drugs.

But should a school that has some confirmed smokers offer a social influence anti-smoking program at all? That is, do the benefits for the majority outweigh the negative results for early cigarette users? Obviously, schools in which most seventh graders already smoke have little to gain from offering a prevention program at that time. However, there might be some benefit from implementing a program at the beginning of sixth grade—when smoking patterns, other deviant behavior, and bad associations may be less entrenched. In schools where confirmed smokers constitute a smaller or nonexistent group, we recommend implementing this approach in seventh grade. For the early smokers, supplementing the prevention program with counseling and smoking cessation assistance should be considered.

In sum, we believe that Project ALERT has made several important contributions to the campaign to reduce adolescent drug use. First, it has demonstrated that the social influence model, as implemented in Project ALERT, works against two drugs. Second, it has shown that the model works for adolescents who are at different levels of risk for use. Third, it has demonstrated how important prevailing social attitudes are for curbing drug use, and it has indicated what the social influence model can and cannot be expected to accomplish. Fourth, it has dispelled the notion that minority children are less likely to respond to prevention programs than middle-class white children are. Finally, it has produced a drug prevention curriculum, given it a rigorous field test, and demonstrated its effectiveness in a broad variety of community settings.

[8]U.S. Surgeon General, 1986.
[9]Robins and Przybeck, 1985.
[10]Kandel, 1975; Yamaguchi and Kandel, 1984.

Appendix A

DETAILED DESCRIPTION OF PROJECT ALERT SESSIONS

SESSION 1: REASONS PEOPLE DO AND DO NOT USE DRUGS

The first session sets the stage for the program. The health educator introduces Project ALERT and tells the students that during the eight-session program, they will discuss why people do and do not use drugs, will learn how to identify and resist pro-drug arguments, and will learn how to say "no" when they feel pressured to try cigarettes, marijuana, alcohol, or other substances.

Students are then divided into groups and asked to write down reasons why some people do smoke cigarettes or marijuana and why most do not. Their lists, which are taped on the blackboard, typically include some aspect of peer pressure: to be accepted, to be "cool," to be part of the group.

The focus on peer pressure sets the stage for the "saying no" exercises later in the curriculum. Students also suggest other reasons—e.g., using pot or cigarettes is relaxing or helps you get away from your troubles. These responses allow the health educator to correct misconceptions such as the belief that cigarettes and marijuana are physically relaxing.[1]

When asked to give reasons why people do *not* use pot or cigarettes, students usually point out that both substances are bad for your health, can get you in trouble, and waste money. In addition, they mention the effects of cigarettes on one's social acceptability and lungs while noting that pot can "mess up your life" (affect one's grades and motivation) and "make you feel terrible" (nauseated, paranoid). These themes are elaborated in a film, *Let's Talk About Marijuana*, which shows junior high school and high school students discussing why some teenagers use pot and why most of them do not.

[1]Both cigarettes and marijuana actually *increase* heart rate rather than relax the body. People addicted to nicotine physically need its presence in the bloodstream to avert the feeling of tension that comes from nicotine withdrawal. When they raise their nicotine level again, the tense feeling abates and they feel relaxed. In the case of marijuana, users feel relaxed because the drug slows down reaction time, thought processes, and the ability to register what people are saying.

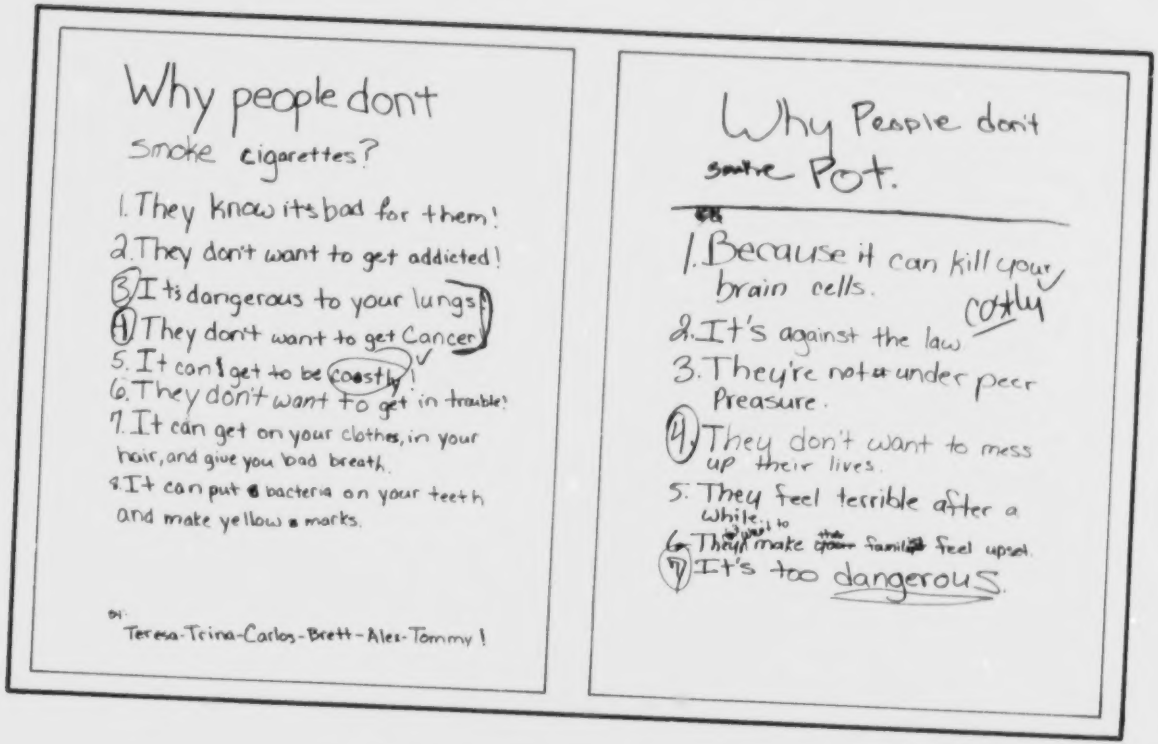
Why people don't
smoke cigarettes?
1. They know its bad for them!
2. They don't want to get addicted!
3. It's dangerous to your lungs!
4. They don't want to get Cancer
5. It can't get to be costly!
6. They don't want to get in trouble!
7. It can get on your clothes, in your hair, and give you bad breath.
8. It can put bacteria on your teeth and make yellow marks.
By:
Teresa-Trina-Carlos-Brett-Alex-Tommy!
Why People don't
smoke Pot.
1. Because it can kill your brain cells.
2. It's against the law
costly
3. They're not under peer Preasure.
4. They don't want to mess up their lives.
5. They feel terrible after a while.
6. They'll make feel upset.
7. It's too dangerous.

Fig. A.1—An example of Session 1 materials

These activities bring out consequences of use that are immediately relevant to teenagers while avoiding didactic lecturing and scare tactics that might cause students to avoid or block out the message. They also make the curriculum specific, clarifying student beliefs about the harmfulness or desirability of *each* substance. Because they are elicited from the students themselves, the "why not" lists automatically reflect the consequences of drug use that seventh graders consider *serious* and *likely*.

SESSION 2: CONSEQUENCES OF USE

The second session builds on these ideas by asking students to trace what happens "after you smoke a cigarette or marijuana joint the first time, after you've smoked a while (regularly at parties), and after you've smoked a long time (several years)." Using question-and-answer techniques, the health educator elicits important consequences that students may not have mentioned, corrects erroneous perceptions, and clarifies problems associated with smokeless tobacco products. These discussions are supplemented by specially designed posters depicting the effects of tobacco and marijuana use and by an original film dramatizing the effects of using pot at a party.

During the first booster session in eighth grade, the material on drug use consequences is expanded to include problems associated with alcohol use along with new facts about cocaine, drinking and driving, and smokeless tobacco.

Because adolescents tend to be present-oriented, Session 2 stresses the immediate and social consequences of use: how cigarette smoking can affect one's personal attractiveness (yellow teeth, "ashtray" breath, smelly hair and clothes); how marijuana use affects the ability to control one's actions, to drive a car, to cope with one's emotions, and to communicate and remember; and how both can interfere with performance at sports or cause trouble at home or at school. Immediate consequences heighten student *susceptibility* to the effects of trying drugs; social consequences emphasize results that adolescents consider *serious*. Long-term health hazards, although also discussed, are given less emphasis.

SESSION 3: IDENTIFYING AND COUNTERING PRO-DRUG PRESSURES

In the third session, the students demonstrate their own skills at identifying and countering pro-drug arguments. This session, which introduces pressures to use drugs, is designed to reduce barriers to resistance: inability to identify internal and external pressures, the belief that use is widespread, and inadequate skills in countering pro-drug arguments. It has three activities: (1) identifying where pressures come from; (2) getting an accurate picture of drug use; and (3) outsmarting the advertisers.

The class begins with a group discussion and poster-making activity focused on identifying both the sources of pressure (friends, parents or other adults, the media, oneself) and specific "pressure messages" that might emanate from each source. Because students typically omit "pressures from inside yourself," we provide the health educator with questions that draw out the appropriate response. Students then think up counterarguments to one or two of the pressure messages written on the poster.

To further demonstrate what internal pressures are like and to reinforce group norms against use, the health educator asks students to estimate the proportion of eighth graders in their district who have used cigarettes (and then marijuana) in the past month. Their estimates, which typically exceed actual prevalence rates, are countered with statistics showing that only a minority are current users.[2] Students are encouraged to recognize that choosing not to use drugs places them in the majority and to explain "why we usually think most people use" (we see the same kids smoking in the same places; nonusers seldom talk about what they don't do; nobody notices that a group of kids is not using pot or drinking).

In the final activity of Session 3, students play "outsmart the advertisers." Using ads the teacher had earlier asked them to bring from home, they identify how advertisers associate cigarettes and alcohol with things most people want—for example, cigarettes will make you glamorous, independent, and liberated if you are a woman or macho if you are a man, or drinkers are successful people with good taste. The health educator points out what powerful messages these are and how they appeal to values reinforced in the culture in many other ways. Students then rewrite their ads to tell the *real* truth

[2]District data came from the prebaseline survey used in assigning schools to the experimental conditions.

"You've come a long way, baby – to the hospital"

"Baby, you'll last longer if you don't smoke"

"Drink tonight, hangover tomorrow"

"Then I flunked to Myers's rum"

"Be a real cowboy, don't smoke!"

"Come puff your life away"

Fig. A.2—An example of Session 3 materials

about cigarettes and alcohol—e.g., "Come puff your life away," or "Then I flunked to Myers's rum."

SESSIONS 4 AND 5: SAYING "NO" TO EXTERNAL AND INTERNAL PRESSURE

The fourth and fifth sessions tackle an additional barrier to resistance: difficulty in saying "no" to direct offers of a cigarette, a drink, or a marijuana joint and to the more indirect pressures that come from within ourselves. In schools assigned to the teen-leader program, these sessions also serve to introduce the teen leaders.

During Session 4, we stress that there are several *different* ways to say "no"; if one way does not feel comfortable, perhaps another will. After viewing a "trigger" film in which the heroine is faced with the challenge of refusing the offer of a cigarette from a boy she much admires, the students form small groups to act out how the film character can say "no" and still feel good about herself. Once they have presented their skits, the students are asked to compare their own solutions with the three shown on film and with the six ways to say "no" shown on a poster (a simple "no," giving a reason, offering an alternative, standing up to pressure, avoiding the scene, and leaving the scene).

Teen leaders or health educators then elaborate on the several choices depicted in the Ways to Say "No" poster and provide personal examples of how they themselves have resolved similar problems.

Session 5 provides additional "saying no" practice, with an emphasis on *internal* pressures—beliefs that prompt one to try drugs even when no one directly offers them. Teen leaders or health educators help the students identify "pressures from inside yourself" by acting out examples of these beliefs—for example, feeling that trying drugs will make one accepted or less anxious at a party, will overcome boredom, or will demonstrate one's independence and maturity. Students then write down and act out their own responses to several internal pressure scenarios.[3]

[3]To reinforce an overall climate of resistance, the eighth-grade booster sessions include practice in how friends can support each other in saying "no" to drugs as well as exercises designed to reinforce skills learned the previous year.

WAYS TO SAY "NO"
NO THANKS.
Simply say NO
NO, I'M INTO ATHLETICS.
Give a reason
NO THANKS, LET'S GET SOME FOOD INSTEAD.
Offer an alternative
I REALLY MEANT IT WHEN I SAID NO!
Stand up to pressure
Leave the scene
Avoid the scene

Fig. A.3—Poster showing ways to say "no"

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SESSIONS 6 TO 8: REINFORCING THE CORE CURRICULUM AND IDENTIFYING BENEFITS OF RESISTANCE

The last three sessions reinforce the material already presented. They review the consequences of use through a classroom contest, ask students to resolve the dilemma posed in another trigger film depicting two boys offered marijuana at a party, and have students create their own skits in which the central characters say "no" successfully.

Sessions 7 and 8 also point out the benefits of resistance, a concept that implies two distinct but related strategies: clarifying the rewards derived from the act of resisting drugs as well as the benefits of nonuse. Adolescents rarely think about, much less verbalize, the rewards of resistance. Just as they are more likely to notice smokers than nonsmokers, so are they more likely to contemplate the advantages of drug use than those of avoiding it. We seek to make the rewards of resistance more salient by explicitly asking students to write down all "the good things you get" from resisting pressures to use drugs. Seventh graders typically conceptualize these benefits as the reverse form of negative consequences (e.g., improved vs. impaired performance, white vs. yellow teeth, or being able to remember vs. loss of short-term memory). Thus the exercise reminds them of the costs of drug use and of their own vulnerability to these costs.

We also encourage students to write down benefits directly derived from the act of resisting drugs: the sense of personal satisfaction and improved self-image associated with being able to say "no"; increased respect from one's peers and/or family; and the feeling of being in control of one's actions. Because they bring immediate gratification, these rewards have special appeal for adolescents. A videotape depicting teenagers talking about the benefits of resisting pressure supplements this activity.

At the end of the program, students write down "why I don't want to become dependent on drugs" on Project ALERT diplomas. The health educator collects the diplomas, reads volunteered responses, and returns them in a "graduation" exercise.

Appendix B

BASELINE SURVEY ITEMS OTHER THAN PERSONAL SUBSTANCE USE

Variable	Number of Items in Baseline Survey
Perceptions Project ALERT seeks to modify	
Consequences of drug use	14
Likelihood of addiction or dependency	2
Student estimates of drug use prevalence	2
Resistance self-efficacy	9
Benefits of resisting	2
Expectations of future use	3
Other independent variables	
Environmental influences	
Peer use of target substances	6
Peer approval of using target substances	3
Parental use of target substances	3
Parental approval of target substances	3
Sibling use of target substances	3
Offers of target substances	6
Family structure	1
Closeness to parents	1
Subject's behavior and personality	
Rebelliousness, nonconformity	3
Deviant behavior	4
School performance and educational aspirations	2
Self-esteem	2
Depression	1
Background characteristics	
Ethnicity	1
Gender	1
Age	1
Parents' education	4

Appendix C
DETAILED PROGRAM RESULTS BY SUBSTANCE

Table C.1

PROGRAM EFFECTS ON ALCOHOL USE

Alcohol Use in Sample Groups	Postintervention drinking rates among baseline Nonusers (% of 953)			Alcohol Experimenters (% of 1,795)			Alcohol Users (% of 1,130)		
	3 mo	12 mo	15 mo	3 mo	12 mo	15 mo	3 mo	12 mo	15 mo
Ever									
Teen leader	16.3**	47.4	57.2						
Health educator	18.0	45.5	53.7						
Control	22.8	50.0	57.8						
In past month									
Teen leader	5.9**	14.4	22.0	20.9	37.9**	44.2	69.6	73.0	77.0
Health educator	8.0	10.5	18.8	22.3	33.0	42.1	62.7*	70.7	74.4
Control	10.8	14.6	19.8	25.1	31.1	45.1	69.5	71.6	76.5
Monthly[a]									
Teen leader				3.4*	15.1	19.0	37.9	49.3	50.3
Health educator				5.6	13.8	17.6	33.3	45.5	46.7
Control				6.0	12.8	20.0	38.1	49.0	50.2
Weekly (6+ days in past month)									
Teen leader					2.4	4.1	8.0	13.4	15.2
Health educator					2.2	3.6	6.4	10.7	13.6
Control					3.8	3.0	7.0	11.7	15.3
Quit (no use in past year)									
Teen leader					32.8	32.0		6.2	5.3
Health educator					35.0	28.8		4.5	5.4
Control					33.7	29.9		5.9	6.2

SOURCE: Ellickson and Bell, *Science*, 247, 1990.

NOTE: Outcomes omitted where overall use was less than 2.5 percent or otherwise not applicable.

*P ≤ 0.10.

**P ≤ 0.05.

[a]Eleven or more times in past year, or 3 or more days in past month.

Table C.2

PROGRAM EFFECTS ON CIGARETTE USE

Cigarette Use in Sample Groups	Postintervention smoking rates among baseline								
	Nonusers (% of 1,990)			Cigarette Experimenters (% of 1,202)			Cigarette Users (% of 660)		
	3 mo	12 mo	15 mo	3 mo	12 mo	15 mo	3 mo	12 mo	15 mo
Ever									
Teen leader	6.8	23.4	28.9						
Health educator	7.8	24.1	30.6						
Control	6.5	25.8	31.1						
In past month									
Teen leader	3.0	6.0	7.1	12.7	25.7	26.8*	51.8	58.5*	63.2†
Health educator	4.3*	7.1	9.4	13.9	23.2	23.6†	55.3	55.6	56.1
Control	2.3	8.3	8.4	15.6	26.1	32.3	52.8	48.9	48.9
Monthly[a]									
Teen leader				6.4	15.5	16.5**	43.1	57.4†	54.0**
Health educator				6.9	17.9	18.9	40.8	51.7*	48.8
Control				6.8	19.3	22.4	47.8	42.9	43.4
Weekly (6+ days in past month)									
Teen leader					6.0	5.7†	18.4	34.1	34.6*
Health educator					7.9	7.4*	21.0	25.8	27.4
Control					6.5	11.1	18.7	27.5	26.4
Daily (20+ days in past month)									
Teen leader					3.1	2.3**	7.8	17.1	19.0
Health educator					2.7	4.5	12.9**	15.9	18.2
Control					2.6	5.1	6.6	18.1	15.9
Quit (no use in past year)									
Teen leader					50.2	50.3*		15.1	18.6
Health educator					55.2**	54.6†		11.9	15.7
Control					47.0	44.2		15.9	18.7

SOURCE: Ellickson and Bell, *Science*, 247, 1990.

NOTE: Outcomes omitted where overall use was less than 2.5 percent or otherwise not applicable.

*P ≤ 0.10.

**P ≤ 0.05.

†P ≤ 0.01.

[a]Eleven or more times in past year, or 3 or more days in past month.

Table C.3

PROGRAM EFFECTS ON MARIJUANA USE

	Post-intervention marijuana use rates among baseline								
	Marijuana and Cigarette Nonusers (% of 1,976)			Marijuana Nonusers, Cigarette Users (% of 1,344)			Marijuana Users (% of 554)		
Marijuana Use in Sample Groups	3 mo	12 mo	15 mo	3 mo	12 mo	15 mo	3 mo	12 mo	15 mo
Ever									
Teen leader		5.2*	8.3**	4.7	26.0	31.9			
Health educator		4.9**	8.3**	7.4	24.1	31.0			
Control		7.7	12.1	6.4	23.1	28.1			
In past month									
Teen leader		2.1	2.9	2.5	9.4	11.1	28.5	36.7	37.6
Health educator		1.6*	1.4†	2.3	8.3	10.1	24.1	45.9	39.1
Control		3.2	3.7	2.8	11.4	13.6	29.0	43.8	43.8
Monthly[a]									
Teen leader					5.9	7.2	19.3	29.4	29.3
Health educator					3.3**	4.6	19.2	33.8	32.6
Control					6.4	6.4	19.5	33.1	32.5
Weekly (6+ days in past month)									
Teen leader							5.6**	13.8	10.4
Health educator							10.8	15.6	12.9
Control							10.7	16.0	14.2
Quit (no use in past year)									
Teen leader								38.9	37.4
Health educator								29.2	34.1
Control								32.5	32.5

SOURCE: Ellickson and Bell, *Science*, 247, 1990.

NOTE: Outcomes omitted where overall use was less than 2.5 percent or otherwise not applicable.

*$P \leq 0.10$.

**$P \leq 0.05$.

†$P \leq 0.01$.

[a]Eleven or more times in past year, or 3 or more days in past month.

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